CYTISUS SCOPARIUS (SCOTCH BROOM) IN WESTERN AUSTRALIA

By GREG KEIGHERY

Science Division, Department of Environment and Conservation, Locked Bag 104, Bentley Delivery Centre, Western Australia, 6983.

Email: greg.keighery@dec.wa.gov.au

ABSTRACT

Cytisus scoparius, a weed of National Significance was recorded as naturalised in Western Australia for the first time around the Wellington Dam and along the Collie River in 2010. Immediate action by the DEC staff from Collie District has resulted in the removal of nearly all plants and set the stage for the likely eradication of this species in the wild in Western Australia.

INTRODUCTION

Cytisus scoparius (L.) Link. of the family Fabaceae, is a member of a group of closely related genera of long branched green stemmed shrubs with racemes of yellow flowers commonly referred to as Brooms native to the Northern Hemisphere. *Cytisus scoparius* which has several common names including, Scotch, English or Common Broom, is native to Europe from the Ukraine to Ireland, south to Spain and north to Sweden. The species is widely cultivated and has become a weed of temperate areas of western USA, Hawaii, Canada (British Columbia), Australia, New Zealand, Iran, India and South Africa (Hosking *et al.* 1998).

At present a series of other species within the Brooms are also naturalised in Australia, including the closely related Tagasaste or Tree Lucerne (*Chamaecytisus palmensis*), promoted as a fodder plant in Western Australia and the White Spanish broom (*Cytisus multiflorus*).

Other less closely related Brooms naturalised in Australia (Victorian Department of Primary Industries 2011) are Montpellier Broom (*Genista monspessulana*), Flax-Leaved Broom (*Genista linifolia*), Madeira Broom (*Genista stenopetala*), Spanish Broom (*Spartium junceum*), Canary Island Stick Broom (*Adenocarpus complicatus*) and White Broom (*Retama raetum*).

Five Brooms are recorded as naturalised in Western Australia (Hussey *et al.* 2007). These are: *Adenocarpus complicatus*, *Chamaecytisus palmensis*, *Genista*

linifolia, *Genista monspessulana* and *Retama raetum*. The last three species being the most invasive environmental weeds. Occasional feral plants and small populations of another three Brooms *Genista horrida*, *Spartium junceum* and *Genista florida* have also been recorded by me but are not yet fully naturalised in Western Australia.

Cytisus scoparius is currently recorded as naturalised in Australia in the Australian Capital Territory, New South Wales, Victoria, Tasmania and South Australia. Within these jurisdictions major infestations occur in eastern New South Wales (especially Barrington Tops, Shoalhaven River Catchment, Kosciuszko National Park and the Blue Mountains area), and in Victoria, over 150,000 hectares of land in Victoria's central highland and alpine regions. These infestations have led to this species being nominated and subsequently accepted as a Weed of National Significance (Victorian Department of Primary Industries 2011) in 2012.

Cytisus scoparius has never been recorded as naturalised in Western Australia, despite being freely available in the nursery trade and widely grown. However, much of the lower South-West is modelled as a very favourable climatic zone (Victorian Department of Primary Industries 2011) for the species.

This brief note documents the discovery and subsequent attempt to remove this potentially very serious weed species in Western Australia.

RESULTS

During surveys of the flora of Wellington National Park in 2009/10 scattered plants of *Cytisus scoparius* were located in the National Park along the banks of the Collie River. Upon tracing these occurrences upstream towards the Wellington Dam a large population of the weed was located in the Wellington Dam Tourist Precinct. This population is not mentioned in the Management Plan for the area (Conservation Commission of Western Australia 2008), nor on the local Flora (Wheeler, *et al.* (2002). There are no records of *Cytisus scoparius* naturalised in Western Australia on Florabase or the Australian Virtual Herbarium (Western Australian Herbarium 1998).

While most plants were yellow flowered (voucher G. Keighery 17639), red and yellow flowered plants (voucher G. Keighery 17640) were also present in the area. The latter plants are described by Hosking *et al.* (2000) as "Red and yellow flowered hybrids (i.e. horticultural selections from hybrids between *Cytisus scoparius* and other *Cytisus* / *Genista* species) similar to the cultivars Andreanus and Andreanus Yellow have become naturalized in New South Wales, Victoria and Tasmania)". Apparently at least two separate plantings/introductions were

made into the area giving rise to the two colour forms recorded.

The populations along the Collie River and Wellington National Park apparently date from sometime after 1960 when Public Works Architect John Oldham was engaged to landscape the area around the northern side of the enlarged dam and the large quarry (called the Wellington Dam Precinct) which had been used to provide material for the dam.

Oldham stated "We screened and protected the quarry by a natural stone wall around the top – this will guide visitors toward a new lookout designed to project from the hillside pointing firmly back at the dam. The walls of the quarry were scaled down. It was back filled with good soil, planted with lawn and trees, furnished with shelters and barbeques and became a hazard free picnic area.... the lozenge shaped shelters deliberately echo the viewing platform and Dam in shape and materials. Most trees in the quarry are deciduous to let the sun through in winter. The quarry was popular from the start – it came into use immediately after completion" (Oldham, John, 'Landscape of water resources', unpublished speech, held at Heritage Council of Western Australia Library).

Other aspects of the landscaping design included a lookout at the top of the dam, car parks, toilets and a new zigzag road that took visitors below the Dam. The parking areas were designed to follow the contours and prevent removal of trees, and the toilets were blended into the surrounding bushland.

Oldham directed that plantings were, therefore, native species except in the Quarry (PWD file, Wellington Dam, landscaping & buildings, State Records Office Western Australia, WAS 3035 CONS 1869, Item 1960/0424; Oldham, *op cit*, list of native plants sourced from Yilgarnia Nursery). Flowering species for the carpark and toilet surrounds included some 570 kangaroo paw (*Anigozanthos* sp.) of various colour, *Crowea dentata*, Black Wattle (*Acacia decurrens*), a groundcover (*Lechenaultia biloba*), and bottlebrush (*Callistemon* sp, stated as *phoenicus*), as well as 70 Karri (likely the Karri Hazel *Trymalium odoratissimum*). Obviously a broad definition of native to Australia was used to define native species.

After establishment of the viewing area in 1960, a caretaker's quarters and kiosk/cafe were constructed in 1966, following requests for more public facilities. It was probably during the 1970 –1990 period when the original plantings had senesced or died (the café was also closed for several years for two periods over this time) that the *Cytisus* were obtained and planted during attempts at refurbishment of the gardens. By this time the original concept of planting mainly ?local native species in the precinct had been lost and only sporadic maintenance was

occurring. A complete list of plants present in the Wellington Dam precinct has been compiled by me and will be presented as an annotated list in the planned paper on the flora of Wellington National Park.

The oldest *Cytisus* plants present were not now in any garden site and from their size were probably under 20 years old, suggesting that the original garden plantings had also died or been lost. Downey and Smith (2000) have noted that individuals may live for over 30 years, but reach heights of over 6 metres in that time!

There were plants of *Cytisus* all around the margins of the car park spreading down slope into the adjacent Jarrah–Marri Woodlands and onto granite slopes above the dam which are dominated by low heaths of *Verticordia* and *Calytrix* species grading into tall *Acacia* shrublands. Population size of the weed was over 100 mature plants with numerous juveniles. Scattered plants were located along the river edge in *Eucalyptus rudis* woodland below the granite cliffs below the dam and for several kilometres downstream. In eastern Australia the species is known to be an aggressive invader of fertile relatively open sites, such as granite soils and riverine edges. Smith (2000) noted that the seed can be carried long distances in the bed load of rivers, where scouring in the stream bed may scarify the seed preparing it for germination when it washes up on the bank.

Subsequent to the discovery of this population, DEC staff from Collie carried out control measures on the area following techniques outlined in Hosking *et al.* (2000) which has resulted in the cutting down / spraying of all adult plants and juveniles resulting in the destruction of over 95% of the population. I have removed any plants located along the river. It is encouraging to note that significant progress has been made on eradicating a potential serious environmental weed immediately after its discovery.

However, Downey and Smith (2000), Hosking *et al.* (1998) and Bossard (2000) note that this species produces some 8–15,000 seeds per adult plant per year which can remain viable for at least 5 (and up to 30) years in the soil, so continual monitoring of the Park will be vital for many years

CONCLUSIONS

The discovery of this population of Scotch Broom highlights the need for surveillance and early control efforts for these potentially serious weeds. Most water supply dams had gardens established around their lookouts and these should be surveyed for more populations of this weed. It also illustrates the need for vigilance in the planting of such species within natural environments and the need for removal and replace-

ment by more benign species of all Brooms from the Australian nursery trade.

REFERENCES

BOSSARD, C. C. 2000. *Cytisus scoparius* (L.) Link. In: Bossard, CC, Randall, J.M., Hoshovsky, M.C. (eds.). *Invasive Plants of California's Wildlands*. University of California Press, Berkeley.

CONSERVATION COMMISSION OF WESTERN AUSTRALIA 2008. Wellington National Park, Westralia Conservation Park and Wellington Discovery Forest. Management Plan. Department of Environment and Conservation, Perth.

DOWNEY, P.O. and SMITH, J.M.B. 2000. Demography of the invasive shrub Scotch Broom (*Cytisus scoparius*) at Barrington Tops, New South Wales: insights for management. *Austral Ecology* 25: 477–485.

HOSKING, J.R., SMITH, J.M.B. and SHEPPARD, A.W. 1998. *Cytisus scoparius* (L.) Link subsp. *scoparius*. In: *The Biology of Australian Weeds*, Vol. 2. Panetta, F.D. Groves, R.H. and Sheppard, R.C.H. (eds). R.G. & F.J. Richardson, Melbourne.

HOSKING, J.R., SHEPPARD, A.W. and SMITH, J.M.B. 2000. Best Practice Management Guide, Broom, *Cytisus scoparius*. Co-operative Research Centre for Weed Management Systems, Adelaide.

HUSSEY, B.M.J., KEIGHERY, G.J., DODD, J., LLOYD, S.G. and COUSENS, R.D. 2007. *Western Weeds*. Plant Protection Society, Perth.

SMITH, J.M.B. 2000. An introduction to the biogeography and ecology of broom *Cytisus scoparius* (L.) Link in Australia. *Plant Protection Quarterly* 15: 140–144.

VICTORIAN GOVERNMENT DEPARTMENT of PRIMARY INDUSTRIES. 2011. English Broom, Scotch Broom, Broom, *Cytisus scoparius* (L.) Link. Weed of National Significance Nomination.

WESTERN AUSTRALIAN HERBARIUM 1998–. *FloraBase – The Western Australian Flora*. Department of Environment and Conservation. Available at http://florabase.dec.wa.gov.au/.

WHEELER, J.R., MARCHANT, N.G. and LEWINGTON, M. 2002. *Flora of the South West*. Department of Conservation and Land Management, Como.